BRITISH BEE-KEEPER'S

PRACTICAL NOTE-BOOK

BY

THOS. WM. COWAN, F.L.S., F.G.S., ETC.

Third Edition.

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LONDON:

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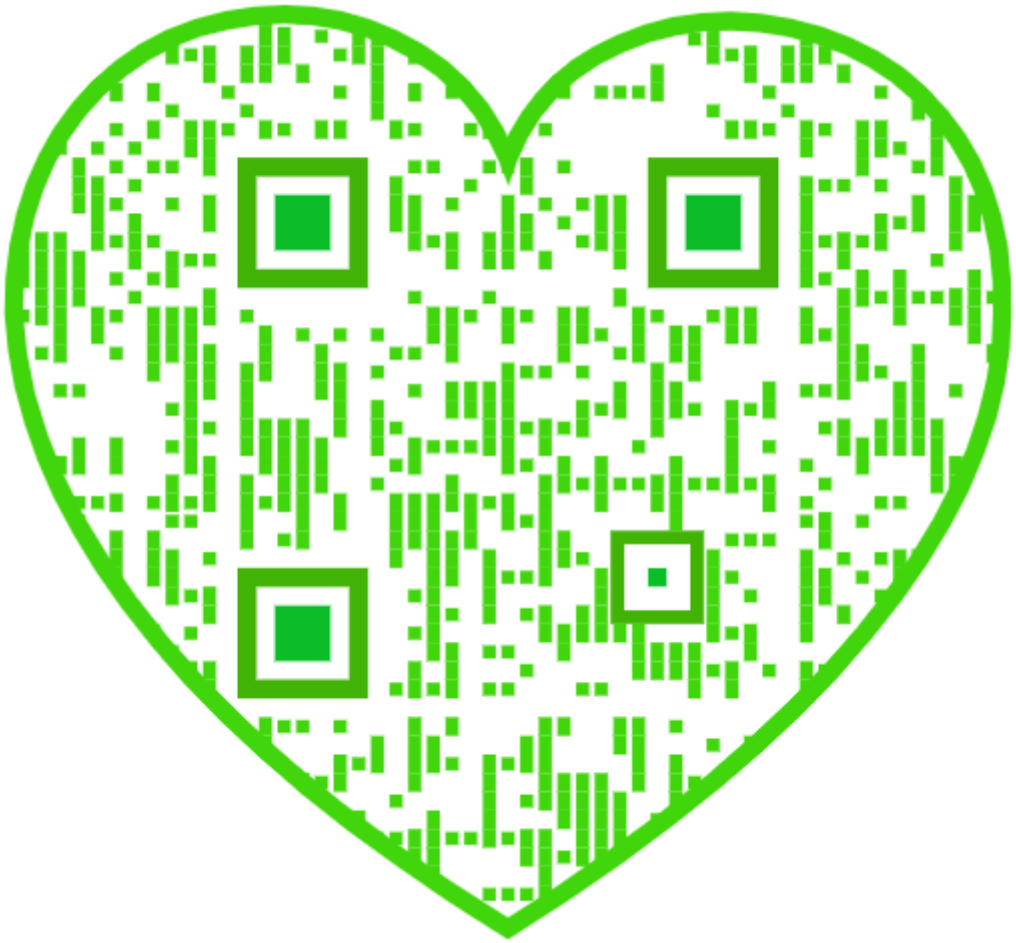

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BRITISH BEE-KEEPER'S

PRACTICAL NOTE-BOOK

FOLLOWED BY A DESCRIPTION OF

THE 'W. B. C.' HIVE AND HOW TO MAKE IT, A HOME-MADE HIVE FROM USED BOXES, HOW TO BUILD A BEE HOUSE, AND SHORT RULES FOR THE MANAGEMENT OF MOVEABLE-COMB HIVES.

BY

THOS. WM. COWAN, F.L.S., F.G.S., F.R.M.S., ETC.

Chairman British Bee-keepers' Association;
Editor of 'British Bee Journal;'

Author of 'The Honey Bee: Its Natural History, Anatomy, and Physiology,'
'The British Bee-keeper's Guide-book,'
'Foul Brood and its Treatment,' 'Bees and their Management,'
'Wintering Bees,' 'Doubling and Storifying,'
'How to Make an Extractor and Bellows Smoker,' etc.

Member of the British Association for the Advancement of Science;
Honorary Member of several Bee-keepers' Associations in Europe and America, etc. etc.

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INTRODUCTION.

WHEN a bee-keeper has only a few stocks of bees, and these are kept for amusement, it matters very little whether he keeps a note-book or not; but when a large number of bees are kept for profit, it is absolutely necessary that accurate entries be made of all observations and operations. There being no satisfactory note-book to assist the bee-keeper in this work, the following Tables have been arranged in the hope that they may supply a long-felt want, frequently expressed to the author. There are sufficient Tables for one year's entries in a large apiary, and the moderate price at which this Note-book is issued will place it within the reach of every bee-keeper. To those who are in a position to do so, it would greatly assist the science if they would record observations with respect to the weather, and for this purpose Tables I. and II. will be found useful. At present very little is known as to the relation of the secretion of nectar in plants in regard to the weather, and if reliable statistics from various districts could be collected for a number of years, the laws regulating the production of honey might be discovered.

Most of the other Tables are so simple as to require no explanation.

Chapters on making hives and bee-houses have been added in this edition in response to the frequent applications for this information.

This Note-book is intended as a pocket companion for the bee-keeper, therefore a few rules on general management of bees, such as he may require, are given at the end.

For the complete and practical management of bees in moveable-comb hives the bee-keeper is referred to the *British Bee-keeper's Guide-book*, by the same author.

8 *Henrietta Street, Covent Garden, London, W.C., Jan.* 1908.

148446

Month of *Year*

Date.	Hour.	Height of Barometer.	Height of Thermom.	Wind.	General account of the Weather.	Ingathering	What Flowers in bloom.

EXAMPLE FOR FILLING IN , YEAR 1908.

Month of May.						
22	9 a.m.	29.23	64.2	S.E.	Clear.	Good.	White Clover.

Month of *Year*

Date.	Hour.	Height of Barometer.	Thermom.	Wind.	General account of the Weather.	Ingathering	What Flowers in bloom.

Month of *Year*

Date.	Hour.	Height of Barometer.	Height of Thermom.	Wind.	General account of the Weather.	General account of the Ingathering	What Flowers in bloom.

Month of *Year*

Date.	Hour.	Height of Barometer.	Thermom.	Wind.	General account of the Weather.	Ingathering	What Flowers in bloom.

Month of *Year*

Date.	Hour.	Height of Barometer.	Height of Thermom.	Wind.	General account of the Weather.	General account of the Ingathering	What Flowers in bloom.

Month of *Year*

Date.	Hour.	Height of Barometer.	Height of Thermom.	Wind.	General account of the Weather. Ingathering	What Flowers in bloom.

Month *Year*

Date.	Hour.	Height of Barometer.	Thermom.	Wind.	State of the Weather.	Observations made on Individual Stocks.

Month *Year*

Date.	Hour.	Height of Barometer.	Thermom.	Wind.	State of the Weather.	Observations made on Individual Stocks.

III.—OBSERVATIONS DURING WINTER.

Month [redacted] *Year* [redacted]

Date.	Hour.	Height of Barometer.	Height of Thermom.	Wind.	State of the Weather.	Observations made on Individual Stocks.

Month *Year*

Date.	Hour.	Height of Barometer.	Thermom.	Wind.	State of the Weather.	Observations made on Individual Stocks.

II.—OBSERVATIONS DURING WINTER.

Month *Year*

Date.	Hour.	Height of Barometer.	Thermom.	Wind.	State of the Weather.	Observations made on Individual Stocks.

Month *Year*

Date.	Hour.	Height of Barometer.	Thermom.	Wind.	State of the Weather.	Observations made on Individual Stocks.

Year

No. of Stock.	Description of Stock.	When Queen commenced to Lay. Month.	Day.	Age of Queen	Race.	Size.	Colour.	Prolificness.	General Remarks.

Year

No. of Stock.	Description of Stock.	When Queen commenced to Lay. Month.	Day.	Age of Queen	Race.	Size.	Colour.	Prolificness	General Remarks.

Year

Nucleus No.	No. of stock from which Queen-cell removed.	Date of Removal of Queen.	Queen-cell introduced to Nucleus.	Date of Hatching of Queen.	Commenced to Lay.	Race.	Remarks.

Year

Nucleus No.	No. of Stock from which Queen-cell removed.	Date of Removal of Queen.	Queen-cell introduced to Nucleus.	Date of Hatching of Queen.	Commenced to Lay.	Race.	Remarks.

V.—NUMBER OF BROOD COMBS IN STOCK

Month

No. of Stock.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

EXAMPLE FOR FILLING IN :—

18				3										5			

Spring of 190 .

18	19	20	21	22	23	24	25	26	27	28	29	30	31	General Remarks as to Brood-Rearing, &c.

V.—NUMBER OF BROOD COMBS IN STOCK

Month

No. of Stock.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Spring of 190 .

18	19	20	21	22	23	24	25	26	27	28	29	30	31	General Remarks as to Brood-Rearing, &c.

Year

Month	Day.	No. of Stock.	Description of Stock.	Natural Swarms.			Artificial Swarms.		Race.	Remarks as to Method of making Swarms, &c.
				First.	Second	Maiden	Nucleus	By division		

Year

Month	Day.	No. of Stock.	Description of Stock.	Natural | Artificial Swarms.					Race.	Remarks as to Method of making Swarms, &c.
				First.	Second	Maiden	Nucleus	By division		

Honey and Wax.

Month	Day.	No. of Stock	Extracted Honey.			Comb Honey.			Wax.	Value.		
			Weight in lbs.	Quality.	From what bloom.	1 lb. Sectn.	Other sectn.	From what bloom.	Weight in lbs.	£	s.	d.

Honey and Wax.

Month	Day.	No. of Stock	Extracted Honey.			Comb Honey.			Wax.	Value.		
			Weight in lbs.	Quality.	From what bloom.	1 lb. Sectn.	Other Sectn.	From what bloom.	Weight in lbs.	£	s.	d.

VIII.—FOOD TABLE AND GENERAL REMARKS ON EACH STOCK.

Year

No. of Stock.	Month.	Day.	Description of Feeding.	Quantity of Food in lbs.	General Remarks.

Year

No. of Stock.	Month	Day.	Description of Feeding.	Quantity of Food in lbs.	General Remarks.

VIII.—FOOD TABLE AND GENERAL REMARKS ON EACH STOCK.

Year

No. of Stock.	Month.	Day.	Description of Feeding.	Quantity of Food in lbs.	General Remarks.

Year

No. of Stock.	Month.	Day.	Description of Feeding.	Quantity of Food in lbs.	General Remarks.

VIII.—FOOD TABLE AND GENERAL REMARKS ON EACH STOCK.

Year

No. of Stock.	Month	Day.	Description of Feeding.	Quantity of Food in lbs.	General Remarks.

Year

No. of Stock.	Month	Day.	Description of Feeding.	Quantity of Food in lbs.	General Remarks.

Year	General Remarks on the Year.	No. of Stocks in Spring	No. of Stocks lost in Winter.	No. of Stocks in Autumn	Natural and Artificial Swarms.					Total No. of Colonies prepared for Wintering
					First.	Second	Maiden	Nucleus	Division	

Produce in Honey and Wax.					Value of Produce.			Value of Bees sold.			Total Income.			Total Expenditure.			Profit per Stock.		
Extracted.		Comb Honey.		Wax.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1st Quality.	2nd Quality.	1 lb. Section.	Other sizes.																

Year.	General Remarks on the Year.	No. of Stocks in Spring	No. of Stocks lost in Winter.	No. of Stocks in Autumn	Natural and Artificial Swarms.					Total No. of Colonies prepared for Wintering
					First.	Second	Maiden	Nucleus	Division	

Produce in Honey and Wax.					Value of Produce			Value of Bees sold.			Total Income.			Total Expenditure.			Profit per Stock.		
Extracted.		Comb Honey.		Wax.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1st Quality.	2nd Quality	1 lb. section	Other sizes																

Put into Winter Quarters Autumn, 190 .

Day and Month.	No. of Stock.	Description of Hive.	Race.	United with No.	Description of Wintering.	No. of Frames.	Quantity of Food.

Examined in Spring, 190 .

Day and Month	Condition of Bees.	Condition of Queen.	Quantity of Brood.	Quantity of Food remaining	United to No.	Cause of Loss.	Commenced Feeding.	General Remarks

Put into Winter Quarters Autumn, 190 .

Day and Month	No. of Stock.	Description of Hive.	Race.	United with No.	Description of Wintering.	No. of Frames	Quantity of Food.

Examined in Spring, 190 .

Day and Month	Condition of Bees.	Condition of Queen.	Quantity of Brood.	Quantity of Food remaining	United to No.	Cause of Loss.	Commenced Feeding.	General Remarks

XI.—INVENTORY OF STOCKS.

Year

No.	Description of Hive.	Race.	Cost of Hive. £	s.	d.	Cost of Bees. £	s.	d.	Total Value of Stock. £	s.	d.	Present Value of Hive. £	s.	d.	Present Value of Bees. £	s.	d.	Remarks.

Year

No.	Description of Hive.	Race.	Cost of Hive. £	s.	d.	Cost of Bees. £	s.	d.	Total Value of Stock. £	s.	d.	Present Value of Hive. £	s.	d.	Present Value of Bees. £	s.	d.	Remarks.

Year

Month.	Day.	Receipts.	£	*s.*	*d.*

Year

Month.	Day.	EXPENDITURE.	£	*s.*	*d.*

Year

Month.	Day.	Receipts.	£	*s.*	*d.*

Year

Month.	Day.	EXPENDITURE.	£	*s.*	*d.*

THE 'W. B. C.' HIVE.

How to Make it.

The long-continued favour with which the hive designated as above has been regarded shows no signs of decrease though more than eighteen years have passed since it was first brought to public notice. Nearly every bee-appliance maker in the kingdom pro-

The 'W. B. C.' Hive.

minently illustrates the 'W. B. C.' in his catalogue; and although some makers, naturally desirous of keeping up to date, have added 'non-swarming' and various other so-called improvements, the original more than holds its own as a hive for general use. A striking proof of this fact occurred at the 'Royal' show of the

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year 1903, when the judges (one of whom was Mr. T. W. Cowan) awarded the first prize in the class for most 'complete hive for general use' to the original 'W. B. C.,' though staged alongside hives of the same type—and by the same makers—with 'improvements' added. Since then a 'W. B. C.' hive has taken first prize at the 'Royal' show every year in which it has been staged.

So much for its past history. And if further corroboration of what is stated above were needed, the fact that the following particulars descriptive of the hive in question have been reprinted four times, and as often sold out, surely affords it. It has therefore been decided to append the full details to future editions of the *Bee-keeper's Note Book*, for the use of those wishing to make the hive for themselves :—

Beginning with the *Floor-board* (Fig. 1), the boards forming it are $\frac{1}{2}$ in. thick, tongued and grooved where joined, and nailed on to stout battens, $2\frac{1}{2}$ in. deep by $1\frac{1}{2}$ in. wide. Between the points at

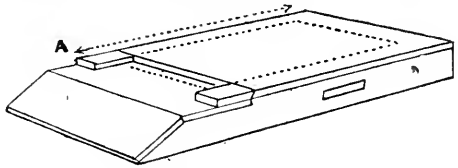


Fig. 1.—Floor-board.

A on sketch it measures 20 in., and the width across is $19\frac{1}{8}$ in. The alighting-board projects 7 in. beyond the point A. The form of the entrance, as seen in sketch, explains itself; it is $15\frac{1}{2}$ in. long by $\frac{1}{2}$ in. high.

The *Outer Case*, including roof, is in three parts, the first of

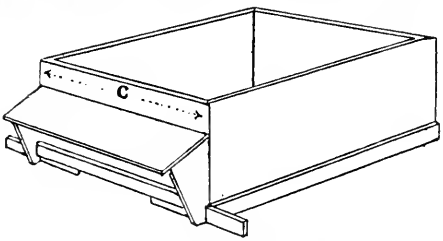


Fig. 2.—Outer Case.

which is as seen (Fig. 2). The front and back boards are $19\frac{1}{4}$ in. long, $8\frac{7}{8}$ in. wide, and $\frac{1}{2}$ in. thick. Sides, $19 \times 8\frac{7}{8}$ in. of $\frac{5}{8}$-in. stuff.

Inside measure, when nailed up, 18 in. across the front, 19 in. from front to rear. A plinth, $1\frac{1}{2}$ in. wide, drops $\frac{3}{4}$ in. below the surface of floor-board to carry off wet. The slides for entrance are of $\frac{1}{2}$-in. wood, 10 in. long by $1\frac{1}{4}$ in. wide, and pass through a slot cut in the outer case along the guide-piece nailed across the front, below porch. The latter extends along the whole front, and is $4\frac{1}{2}$ in. wide, with a groove cut in its lower edge to carry off drip.

The second portion of the outer case is simply a 'lift,' $6\frac{1}{2}$ in. deep, wood same thickness as lower part, and needs no explanation beyond

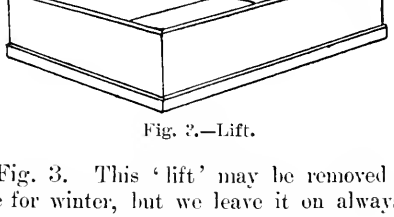


Fig. 3.—Lift.

reference to Fig. 3. This 'lift' may be removed to reduce the height of hive for winter, but we leave it on always: it keeps off cold winds when examining hive in the early season, and forms a roomy covering for plenty of top packing, &c.

The *Roof* is very simple, formed with a view to lightness, and being thoroughly rainproof. The sketch (Fig. 4) will make the main points in its construction plain; for the rest, the front and back pieces are $\frac{1}{2}$ in. thick, $20\frac{3}{8}$ in. long, $2\frac{1}{4}$ in. deep at ends, rising to $3\frac{1}{4}$ in. in the centre or ridge; sides are of $\frac{7}{8}$-in. stuff, $20\frac{1}{8}$ in. long, $2\frac{1}{4}$ in. deep. Along the lower edge of side-pieces a rabbet is cut $\frac{3}{8} \times \frac{1}{2}$ in. deep. This allows the roof to slip over the

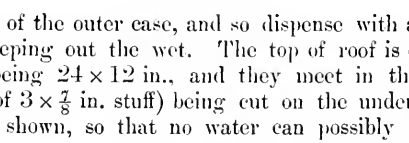


Fig. 4.—Roof.

lower portion of the outer case, and so dispense with a plinth while effectually keeping out the wet. The top of roof is of $\frac{1}{2}$ in. wood, each piece being 24×12 in., and they meet in the centre, the ridge-piece (of $3 \times \frac{7}{8}$ in. stuff) being cut on the under side to cover the joint as shown, so that no water can possibly get in. The

front and back roof-pieces (cut as shown on page 62) complete the outer case, and we need only add that each of the separate parts fits *easily* over the other—no 'tightness' anywhere so long as bees cannot enter from outside.

The *Body Box* (Fig. 5) is $14\frac{1}{2} \times 15\frac{5}{8}$ in. inside measure; it holds ten standard frames and a division-board (or dummy), along with two strips of *thin* wood, $\frac{3}{8}$ in. *wide* and $16\frac{1}{2}$ in. long. The front and back boards are $\frac{5}{8}$ in. thick, $15\frac{5}{8}$ in. long, by $8\frac{1}{4}$ in. wide; side pieces, $17\frac{1}{16}$ in. long, 9 in. wide, and $\frac{3}{8}$ in. thick: the strip of

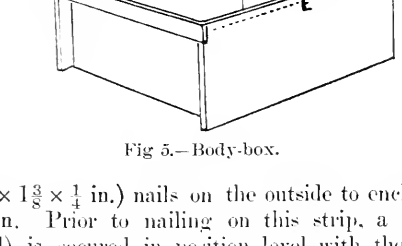


Fig 5.—Body-box.

wood **D** ($16\frac{3}{8} \times 1\frac{3}{8} \times \frac{1}{4}$ in.) nails on the outside to enclose the frame ends as shown. Prior to nailing on this strip, a piece of wood ($\frac{5}{8} \times \frac{5}{8}$ in. full) is secured in position level with the top edge of front and back boards, along which are nailed the tin angle-pieces, forming the 'metal runners' whereon the frames—fitted with 'W. B. C.' ends—work.

The *Shallow-frame Box*, or surplus chamber (Fig. 6) is an exact counterpart of body-box with two exceptions: first, the depth is reduced by 3 in.; second, the front and back boards are

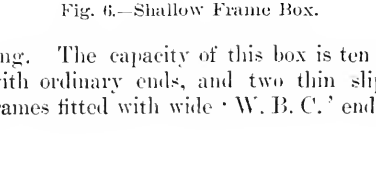


Fig. 6.—Shallow Frame Box.

only $15\frac{1}{8}$ in. long. The capacity of this box is ten shallow-frames $5\frac{1}{8}$ in. deep, with ordinary ends, and two thin slips of wood, or eight similar frames fitted with wide 'W. B. C.' ends.

The hive, as described, is without legs, and we use the *Stand* (Fig. 7). To a casual observer, the stand is simply four legs and four side-pieces nailed together, and will perhaps suggest a very

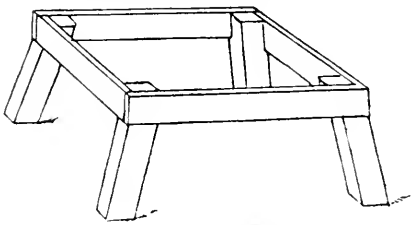


Fig. 7.—Stand.

fragile, shaky affair. But it is as firm and rigid almost as if made of cast iron, and the secret of this firmness is in the peculiar way in which the leg is cut, and the 'collar' of wood fitted on to it.

To any one who understands the use of a bevel, the sketch (Fig. 8) of one leg here given explains itself to a joiner, but the amateur may require a few words of explanation. So let him take a piece of scantling $3 \times 2\frac{1}{2}$ in. and cut up into lengths, as sketch (Fig. 9), according to the number and height of the stands required. He then arranges the legs in pairs and marks them off with the bevel, to give a 'splay' of about $2\frac{1}{2}$ in. *from the corners*, so that, when cut, the legs are 'splayed' outwards on all sides. The idea will be seen in diagram (Fig. 10), and when the 'collar'—made from $\frac{3}{4}$ in. stuff, and $2\frac{1}{2}$ in. wide—is nailed on, and the stand completed as in sketch (Fig. 7), given above, there is a resisting 'set' of the legs from whichever side pressure is used. Stands must be made to fit the floor-boards used.

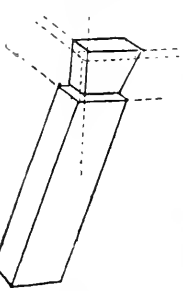


Fig. 8.

Fig. 10.

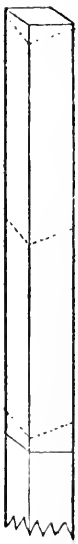


Fig. 9.

The 'eke' (Fig. 11) may be described as a slice, 3 in. deep, from the lower side of the body-box (Fig. 5), and, beyond stating that the four slips of wood shown on the upper edge are for keeping

it in position when fixed, the sketch explains itself. This 'eke' may be used for giving space below combs in winter, and, having served this purpose, by reversing and setting it above frames in

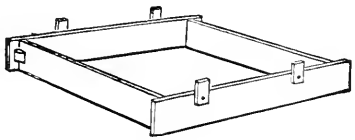


Fig. 11.—'Eke.'

early spring, it helps in 'tucking in' additional warm wrappings. Finally, when set below the shallow-frame box (Fig. 6), it converts the latter into a full-sized brood-chamber for standard frames.

January 1904. W. B. C.

In the foregoing somewhat lengthy description we have given full details of the 'W. B. C.' hive, in order that there may be no mistake with regard to the form and measurements of its various parts. It was absolutely necessary to do this in view of the numerous so-called 'W. B. C.' hives now on the market, differing more or less in important details to such an extent that we decline to acknowledge the right of makers to so designate them.

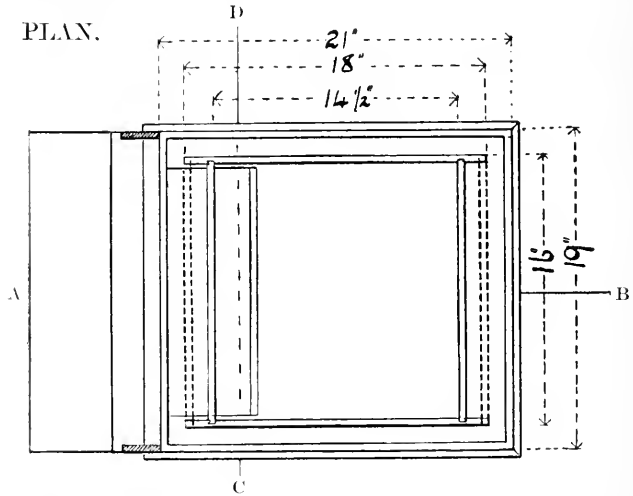
At the same time we admit the difficulty some amateur joiners will find in working out a necessarily long array of figures and fractions of inches. The same thought evidently occurred to our friend Mr. Robert Peebles, of Edinburgh, an experienced bee-keeper, who himself used no other hive but the one in question. Anyway, Mr. Peebles some years ago kindly took the trouble to write for publication in the *British Bee Journal* an alternative plan, which would not only overcome the difficulty, but, as he said, would render 'the making of a "W. B. C." hive as plain as A B C.'

We therefore append Mr. Peebles' plan—with his own illustrations—as described by himself.

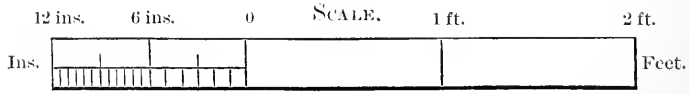
Mr. Peebles' Plan of Making a 'W. B. C.' Hive.

In order to assist those who are able and willing to help themselves in constructing a 'W. B. C.' hive, I have prepared a plan and

two sections, drawn to the accompanying scale, which will, I believe, place the details and measurements of this most useful hive within the power of any such to comprehend or, indeed, commit to memory while working.



Keeping strictly in view the original description as given by the designer, and avoiding technicalities and fractional parts of an inch as much as possible, the principal dimensions will, for all practical purposes, be found correct. The outline tracings are

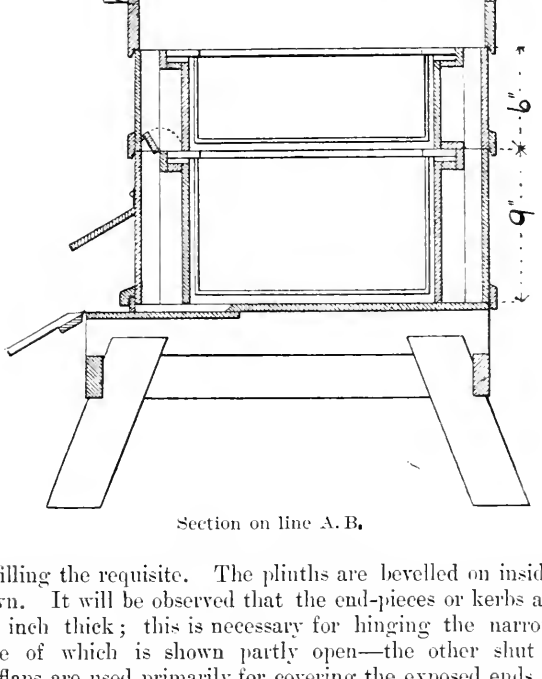


from drawings of my own hives, made in 1892, and the following description applies to them :—

The floor-board, covering of roof, casings, body and surplus-boxes, are made of selected American yellow pine half an inch thick off the saw, and if cut with the perfection of nowadays, all the dressing required is a skim over with a hand-plane to remove the saw marks. If this is attended to, it will be found, when the hive is put together, that the outside sizes marked on plan tally

with the principal inside dimensions originally given by 'W. B. C.' himself.

The frames of the stand and roof, as well as the hive proper, are dovetailed (not simply nailed) together. Where required screws are alone used, and these are previously dipped in paint, the overlaps and plinths being screwed from the *inside*. Where the wood overlaps, it gets two coats of white or red lead and oil previously. There are no hand-holes, the plinths of the case and the ledges on

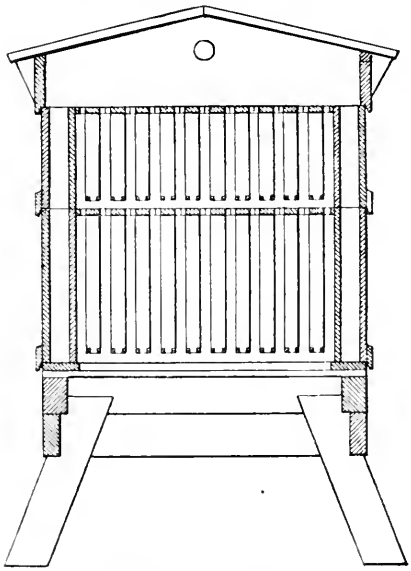


Section on line A. B.

boxes filling the requisite. The plinths are bevelled on inside edge as shown. It will be observed that the end-pieces or kerbs are also half an inch thick; this is necessary for hinging the narrow flaps to—one of which is shown partly open—the other shut down. These flaps are used primarily for covering the exposed ends of top-bars, and for keeping the surplus chambers in position.

I have great pleasure in preparing the tracings and description for your personal consideration and for the benefit of your readers. My desire has been to make everything simple and easy to under-

stand by an amateur joiner of ordinary intelligence. For myself, I will grudge no labour of mine if it will help to make the 'W. B. C.' hive properly and easily understood. When the description and drawings of the hive first appeared in print I at once detected a



Section on line C. D.

few slips, easily remedied by a practical joiner; but the thing most needed was sectional drawings to explain things without so many detailed measurements. I therefore say, Why cannot the 'W. B. C.' hive be made as plain as A B C? *It shall!*

Robert Peebles.

A HOME-MADE HIVE.

Constructed from Used Boxes.

By Harry Clarke,

Used boxes are not, as a rule, advocated for the making of bee-hives, I know, on account of the joining up required if the wrong sort of boxes are used; but from the right sort of boxes very good hives can be made. I enclose a photograph of one made by myself from boxes (see page 64), and, as will be seen, no paint has been used to hide imperfections.

The boxes used are:—(1) An egg-box; (2) lobster-box; and (3) 'Quaker Oats' box. The cost of the boxes is 1*s.* 1*d.*

The Stand.—Cut four pieces from the thickest board of an egg-box, 26 in. long and 4½ in. wide. Put the pieces in pairs and nail each pair together; then at one end cut slanting from 2 in. at the bottom to full width of the board at the top, far enough back to allow a 6-in. alighting-board to be nailed on. Then cut two pieces and nail together to form the crosspiece at the back, measure from the back 19½ in., and fill up to the alighting-board with another piece of the egg-box.

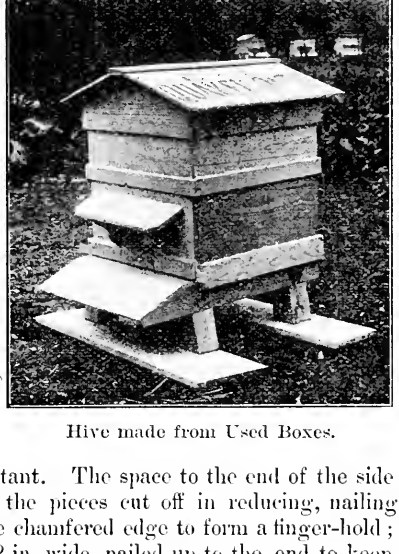
Floor-board.—For this take the end of a 'Quaker Oats' box, and after cutting off the dovetail ends cut two pieces from the other end of the box and nail on to the sides; this will not only make the floor-board the full width, but will keep it from twisting. Cut out entrance in the centre of the front, ⅜ in. deep by 9 in., and back into the floor-board about 2 in., then gradually slant up to level.

Outer Case.—Take the four cross-pieces of the egg-box; these will be found to measure 9¼ by 19¾ in. by ¾ in. Cut two pieces 18 in. long, and two pieces 19½ in., and after planing nail them together, forming a bottomless box 19½ in. square. Then cut from the sides of the egg-box three pieces, 3 in. wide, to form plinths for the back and sides of the outer case; these serve the double purpose of keeping the floor-board in position, and preventing the body-box from being moved out of its place in rough weather.

The entrance-slides can be made by cutting one piece of wood ½ in. wide, and one piece 1½ in. wide, nailing together, so as to form a rabbet. Nail on to the front of the hive, level with the

bottom of the outer case, and fit two pieces to slide in the groove. For the *porch*, cut two small brackets, and nail on a board $19\frac{1}{2}$ in. long by 4 in. wide.

Body-box (*or Brood-chamber*).—Take the four pieces of the lobster-box measuring $9\frac{1}{2}$ in. by 20 in., cut two pieces $8\frac{7}{8}$ in. by $17\frac{1}{8}$ in., and two pieces $8\frac{1}{2}$ in. by 16 in., the latter to be chamfered on the top edge. Nail these at equal distances from each end of the longer pieces, so that the inside measurement is $14\frac{1}{2}$ by 16 in.



Hive made from Used Boxes.

This is important. The space to the end of the side pieces can be filled up with the pieces cut off in reducing, nailing them a little lower than the chamfered edge to form a finger-hold; and two other pieces about 2 in. wide, nailed up to the end to keep the frames in position, finishes the body-box.

Lift.—Take one of the 6-in. pieces of the egg-box, and make another bottomless box, the same outside measurement as the outer case of the body-box, but with plinths nailed on all round.

Roof.—Cut two pieces from the side of the egg-box, 20 in. long and 4 in. wide; also two other pieces, $6\frac{3}{4}$ in. by $19\frac{5}{8}$ in. Mark the centre of the latter, and cut off slanting to 4 in. deep on each side; then nail the four pieces together. For the top, use the two sides

of a 'Quaker Oats' box, measuring 1 ft. by 2 ft., and a further piece 2 in. wide, nailed along the ridge, to prevent any wet getting through the join. This will fit over the lift or body-box, and, to prevent it going too far down, four small strips should be nailed inside, about ½ in. from the bottom.

HOW TO BUILD A BEE-HOUSE.

By 'A Worker Bee.'

For details of construction to accompany the sketch-plan sent, I am afraid that I should find it an easier job to build the house than tell how it should be done. I say this because I am more used to handling tools than the pen, so please correct mistakes. First then we take the *floor* :—(1.) Get two lengths of stuff 7 ft. 10½ in. by 4 in. by 2 in. ; mark off 2 in. from each end for mortise 1 in. thick in centre of 4 in. way. (2.) Next take two pieces 5 ft. 10½ in. by 4 in.

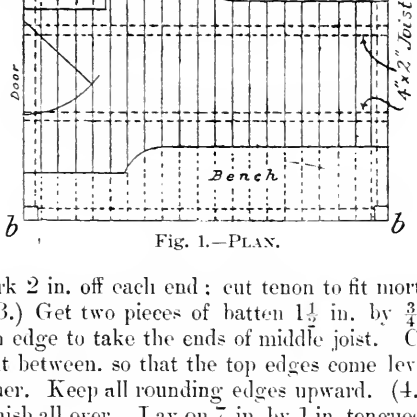


Fig. 1.—Plan.

by 2 in., mark 2 in. off each end ; cut tenon to fit mortises. Knock together. (3.) Get two pieces of batten 1½ in. by ¾ in. ; nail on inside bottom edge to take the ends of middle joist. Cut three 4 in. by 2 in. to fit between, so that the top edges come level ; fasten all firmly together. Keep all rounding edges upward. (4.) Give a coat of black varnish all over. Lay on 7 in. by 1 in. tongued and grooved square-edge matchboards and fasten same down. We now come to the *front* :—(5.) Take two pieces 2 in. by 2 in. red deal 6 ft. long ; mark off 2 in. each end and one 2 in. in centre, and mortise same. then take three rails 2 in. by 2 in., 7 ft. 10½ in. ; tenon these ends ;

drive well together. Our next job (6) deals with the *back* of house. For this use two pieces 8 ft. long; mark off 2 in. each end, 2 in. in centre. We then need three rails same length as front; tenon and drive these together. Finally we come to the *ends* of our house. For these cut three pieces 5 ft. 6½ in. for end opposite door. On the inside of these screw an iron angle-bracket.

Put these latter so that when the back and front are in place the respective squares can be screwed to the rails of back and front end, one of which has the door in it. (7.) Cut one piece 5-ft. 6½-in.

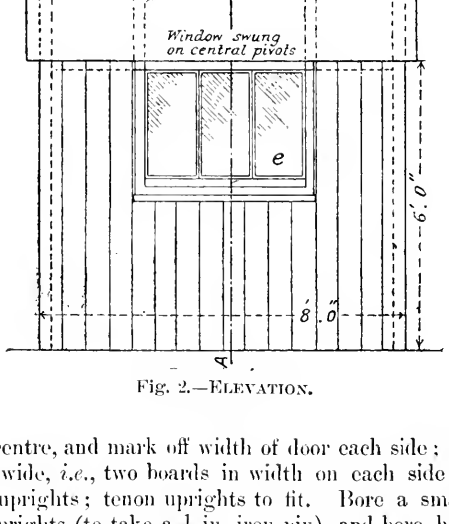


Fig. 2.—Elevation.

board, find centre, and mark off width of door each side; the door is four boards wide, *i.e.*, two boards in width on each side of centre; mortise for uprights; tenon uprights to fit. Bore a small hole in bottom of uprights (to take a ½-in. iron pin), and bore hole in floor to correspond; then screw two more of the angle-brackets to end of this rail. (8.) Place floor where it is to stand on four bricks. Fix up the front and back on it, and stay them in their places. Screw the end rails up in position. The framework will now be in its proper place. Get some pieces of 2 in. by 2 in. scantling for rafters; notch them a little to bear on front and back (do not nail them down). You will now need a few cabin-hooks and eyes, and these must be fastened on so as to be easily hooked or

unhooked. Nail on $\frac{3}{4}$-in. matchboards, letting them project over the frame 2 in. each way.

Be careful that an extra rafter is placed 4 in. from each end of frame, and that the roof-boarding is only fastened to this so that the roof may be lifted off if required for the purpose of shifting. Nail $\frac{3}{4}$-in. boards on back, well painting tongues and grooves wherever the wood bears against rails. Repeat these directions with the end opposite door, except that the last board on each side must be *screwed*, and on no account must the boards be nailed to joists. For *front* get a 4 ft. long by 2 ft. 10 in. high, 3 in. by $2\frac{1}{2}$ in. *casement* or window frame, hung in centre on pivots so as to swing the sash

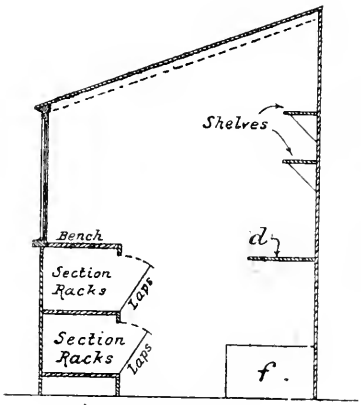


Fig. 3.—Section at A, B.

round easily. Rebate it round the thickness of board; fix in centre of top half; board it round. The end for door is made in the same way, except that the two outside boards are screwed.

It will then be seen that the frame of house rests with bottom-rails on floor; framework to be made so that the outside of frame is flush with outside of floor. The $\frac{3}{4}$-in. boards will then cover frame and sides of joists, and also keep the whole thing rigid. The floor carries the whole weight of house.

If constructed like this, one will be able to take the house to pieces for moving if required. The door is made to suit opening, fitted with rim-lock, and hung with 1-in. T-hinges. Door is shown as opening inwards in sketch, but it might be more conveniently

opened outwards to give extra room. Under the window inside fix a bench, as shown, consisting of three widths of 7-in. by 1-in. tongued matchboards; under this two shelves, as shown, are made of $1\frac{1}{2}$-in. by $\frac{3}{4}$-in. battens; nail on to ledges, leaving a space between each batten; fix bottom shelf 3 in. above floor, the other midway; fill up space from bottom shelf to floor with strip of wood; hang two long narrow doors to close openings between shelf; fit them nicely, and when complete this makes a good place to keep extracting-frames and sections; a few balls of naphthaline are placed under bottom shelf; fix shelves to back on brackets; make all inside fixtures removable.

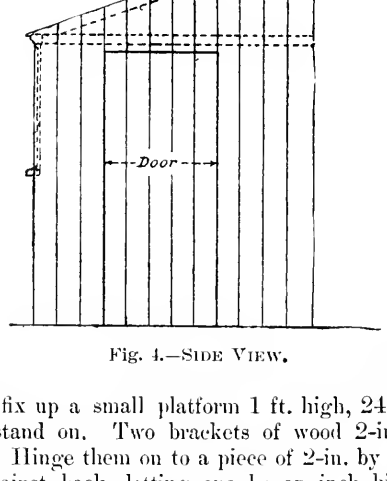


Fig. 4.—Side View.

In corner fix up a small platform 1 ft. high, 24 in. square, for extractor to stand on. Two brackets of wood 2-in. by 1-in. are next wanted. Hinge them on to a piece of 2-in. by 1-in. stuff, and screw this against back, letting one be an inch higher than the other, and fixing them about 3 ft. 10 in. apart. Then get a piece of white wood 4 ft. 6 in. long by 17 in. wide, and in this make V-grooves 2 in. apart, cut lengthways. Screw some small brass plates on its edge. When done, place this on the brackets for a draining-board to stand boxes of shallow frames on after being through the extractor. It can also be used as an 'uncapping-stand.' Cover the draining-board with a couple of coats of pure shellac varnish, and then it will be able to be kept clean with little trouble.

SHORT RULES

FOR THE GENERAL MANAGEMENT OF MOVEABLE-COMB HIVES.

I.—SPRING.

During favourable weather at the end of March, take the opportunity of examining and ascertaining the condition of every hive. Contract the size of the hive with division-boards, so that the bees have only as many combs as they can occupy. Examine each comb as it is removed, and ascertain the presence of the queen. If she has commenced to lay, she may be further stimulated by uncapping some of the honey-cells. Gentle feeding, either with syrup or soft candy, should also be resorted to if the bees are likely to run short of food. If the colony is found queenless, unite it to one having a fertile queen. Should the queen be a drone-breeder, she should be destroyed, and the bees united to another colony. Keep the hives well covered and warm, and disturb as little as possible. Take care only to open on warm days, so as not to chill the brood. As brood increases and the hive gets crowded with bees, breeding may be further stimulated by spreading the brood very cautiously, and continue gentle feeding with liquid food. It is better to give the food at night, to prevent robbing ; also, for the same reason, open hive-entrances only in proportion to the strength of the colony. When warm weather induces frequent flights, provide a drinking-trough for the bees, and induce them to visit this by adding a little honey and salt to the water. Where natural pollen is scarce, give pea-flour, &c., as long as the bees will take it. As breeding and the strength of colonies increase, add frames with empty comb or comb-foundation. It takes about six weeks to build up a colony

of sufficient strength to take advantage of an early flow of honey. Prepare for queen-rearing early in April, according to the instructions given in the *British Bee-keeper's Guide Book*. In the beginning of May, if the weather be favourable, the extra packing used for winter may be removed, and the frames and bees transferred to a clean hive. This done, the hive dealt with is cleaned and dried thoroughly, then used for the next stock operated on, until all are gone through. Continue gentle feeding until the incoming honey exceeds the daily consumption. Be on the look-out for foul brood, and if present commence treatment as directed in *Guide Book* without delay. Only change hives as directed above where all stocks are known to be healthy.

II.—SUMMER.

Prepare racks of sections for use by putting comb-foundation in the boxes, and when the bees begin to store honey in large quantities put on another rack of sections below the first. As fast as any of the sections on the top are completed, they should be removed and stored away in crates. Two or even three racks of sections may be worked at the same time. Towards the close of the season the sections may be finished off in one rack. To prevent the bees swarming, give them additional room in advance of their requirements. Should the bees persist in swarming, remove all the combs, give frames of comb-foundation, and return the swarm; this will generally stop the swarming fever, and not interrupt the work in the sections. Put shallow-frame supers on those colonies intended for extracting, and extract at suitable intervals. Make artificial swarms if required, and check swarming by cutting out queen-cells, extracting honey, and removing frames of brood.

III.—AUTUMN.

Examine all hives, feed when necessary, and unite all weak colonies. Introduce queens to queenless stocks, and if necessary to reduce the number of frames, leave only as many as the

bees can well crowd, and close up with division boards. About 25 to 30 pounds of food is sufficient for the bees to winter on, all of which beyond 5 or 6 pounds should be sealed over. Make passages over the frames by adopting any of the plans recommended in the *Guide Book*. Place warm coverings above frames, and reduce the size of entrances. Prepare honey for market, sort the sections into first and second quality, and put into crates holding twelve to twenty-four. Put the extracted honey as soon as possible into jars, before it begins to granulate, and label neatly.

It cannot be too strongly impressed on the minds of all who keep bees for profit, that one of the main factors in insuring success is the thorough preparation of all stocks in autumn for the work of the following year. This means making sure that every colony is headed by a prolific queen, has plenty of bees, a full supply of sealed stores, and is housed in a dry, rainproof hive.

Second swarms, or casts, hived late in the summer are often found weak in bees when examined in autumn; in such cases 2 or 3 pounds of bees, driven from swarmed skeps, are of the greatest service when added in autumn, and generally make the best and strongest stocks the following year.

In considering the important bearing of autumn bee-work, if well done, on the success or otherwise of the following year, and the increasing favour with which the custom of building up stocks from driven bees is now regarded, it may be well to strongly advise those who adopt this method of increase to go about it in the right way. To begin with, each new colony formed must have about 4 pounds of healthy bees and a young queen. Hive them on four frames fitted with full sheets of foundation (wired) and two frames of ready-built combs, if available, the latter being placed on the outsides of the foundation. This done, about 15 pounds of cane sugar, made into good thick syrup, will be required, and must be given warm in a rapid-feeder, renewing the supply as required, and always giving the food at nightfall after the bees have ceased flying for the day. Cover the feeder well, in order to maintain the warmth and keep the bees busy comb-building

during the cool nights of autumn; it will also enable them to seal the cells as filled. Not only so, but if operations are commenced by the middle of August, a good batch of brood will be reared before cold weather sets in, thus securing the advantage of autumn-bred bees, which are invaluable for early work the following year. On the other hand, driven bees are of far less value when obtained in late autumn, and cannot be expected to do well unless hived on fully built-out combs.

IV.—WINTER.

If properly attended to in the autumn, the bees ought not to be disturbed until the spring. Shade the entrances of hives, and prevent the sun's rays entering to entice the bees to come out. Guard against the attack of birds and mice. Clean and prepare hives for spring use, and purchase or make any new apparatus required, so as to be in readiness in the spring. Boil up old combs and extract wax.

Should feeding have been neglected in the autumn, place a good-sized cake of soft candy above feed-hole in quilts, or under the quilt over the cluster of bees.

For full information upon working Moveable-Comb Hives, read and study the *British Bee-keeper's Guide Book*, by the same author.

As a knowledge of the natural history and habits of the honey bee is of the greatest assistance to the bee-keeper in his practical work, he is recommended during the winter months to study *The Honey Bee: its Natural History, Anatomy, and Physiology*, by the same author.

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and the Use of the Extractor.

By THOS. W. COWAN, F.L.S., F.G.S., &c., &c.,

Chairman British Bee-keepers' Association.

NOTICES BY THE PRESS.

In an article in the *Bee-keepers' Record* of December, 1907, 'D. M. M.,' Banff, says:—"*The* feature of bee-publications this season is the issue of a new and greatly enlarged edition of that masterpiece of "Bee Guides" just launched on the market by Mr. T. W. Cowan.' Confident in the value of his work, the author has issued an edition of nineteen thousand copies, and the wisdom of this greatly enlarged issue at once becomes manifest. The illustrations have been considerably added to, and all over greatly improved. Several new chapters have been added, and special prominence given to bee-diseases. For this alone the book is invaluable, but it has so many other good features that it must be seen and read to be fully appreciated. I predict for it a ready sale. Every one entering our ranks should possess a copy.'

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